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EDUCATION

1979-1983	University of California, Berkeley. A.B. in geology, Dec. 1983.
1984–1985	Princeton University, Ph.D. program in geology.
	Transferred with advisor to U.C. Santa Barbara, Fall 1985.
1985-1989	University of California, Santa Barbara. Ph.D. in geology, Sep. 1989.

PH.D. DISSERTATION

Numerical experiments of double-diffusive convection in magma bodies

RESEARCH INTERESTS

- Heat and mass transfer in geological systems.
- Dynamic behavior of subsurface systems where convection or gravity-driven flow processes occur (e.g., geothermal systems, gas reservoirs, magmatic systems, groundwater contamination in saturated and vadose zones, landfills).
- Code development and applications http://esd.lbl.gov/TOUGH2 http://lnx.lbl.gov/GasEOS
- Injection of CO_2 into natural gas reservoirs for carbon sequestration and enhanced gas recovery (CSEGR)
- Leakage and seepage of CO_2 from geologic sequestration sites.
- Risk assessment of geologic carbon sequestration sites.
- Ferrofluid flow and transport simulation, and applications.

PROFESSIONAL EXPERIENCE

Staff Geological Scientist, LBNL, Oct. 1994–present.
Head, Geologic Carbon Sequestration Program, June 2008-present.
Deputy Head, Geologic Carbon Sequestration Program, April 2007-May 2008.
Hydrogeology Department Head, LBNL, May 2002–Jan. 2006.
Geological Scientist, LBNL, July 1992–Sep. 1994.
Post-doctoral Fellow, LBNL, Oct. 1990–June 1992.
Post-doctoral researcher, UC Santa Barbara, Oct. 1989–Sep. 1990.
Research Assistant, U.C. Santa Barbara, July 1986–Sep. 1989.
Teaching Assistant, U.C. Santa Barbara, Oct. 1985–June 1986.
Assistant in Instruction, Princeton University, Jan.–May 1985.

Assistant in Research, Princeton University, Sep.–Dec. 1984.
Assistant Field Geologist, Chevron Resources. Mar.–Aug. 1984.

PROFESSIONAL ACTIVITIES

Guest Editor for *Transport in Porous Media* Special Issue on Geologic Carbon Sequestration, current.

Co-Guest Editor of *Energy Conversion and Management* Special Issue on TOUGH2 Applications in CO_2 Storage and CH_4-Hydrate Research, 2006

Associate editor of *Carbon Dioxide Capture for Storage in Deep Geologic Formations*, Vol. 2, D.C. Thomas and S.M. Benson, eds., pp 1205–1216, Elsevier, 2005.

Co-Guest Editor of *Vadose Zone Journal* Special Issue on TOUGH2 Applications in Hydrology (*Vadose Zone Journal*, *3*, August 2004).

Associate Editor for *Vadose Zone Journal*.

Guest Editor of *Transport in Porous Media* Special Issue on Strongly Coupled Density-Dependent Flow in Porous Media (*Transport in Porous Media*, May 2002).

INVITED TALKS

Haas School of Business (UCB) class on Energy and Sustainability, April 21, 2009.
Stanford University, Civil and Environmental Engineering seminar, Feb. 2, 2009.
Haas Professional School, taught session on geologic carbon sequestration, Sept. 2008.
Berkeley Energy Resources Collaborative (BERC) Conference, Feb. 2008.
Montana State University, April 11, 2007, "Near-Surface Dispersion of CO_2 Seepage from Geologic Storage Sites: Processes, Impacts, and Detection"
Haas School of Business, March 6, 2007 "Geologic CO_2 storage: a safe and effective approach to reducing point-source CO_2 emissions."
Energy INet Workshop, Calgary, January 26, 2006, "Migration Mechanisms and Potential Impacts of CO_2 Leakage and Seepage from CCS Projects."
U.C. Davis, "Carbon Sequestration with Enhanced Gas Recovery," 2003.
Stanford University, "CO_2 Injection for Carbon Sequestration with Enhanced Gas Recovery," May 14, 2002.

PATENTS

Process for guidance, containment, treatment, and imaging in a subsurface environment utilizing ferrofluids, U.S. Patent No. 6,250,848 B1, June 26, 2001. Inventors: G.J. Moridis and C.M. Oldenburg.

Carbon dioxide as cushion gas for Compressed Air Energy Storage (CAES), Patent Application S.N. PCT/US2009/039281, April 2, 2009. Inventor: C.M. Oldenburg.

PEER-REVIEWED JOURNAL ARTICLES

1. Oldenburg, C.M., J.L. Lewicki, L. Pan, L. Dobeck, and L. Spangler, Origin of the Patchy Emission Pattern at the ZERT CO2 Release Test, *Env. Earth Sci.*, submitted.

2. Pan, L., J.L. Lewicki, C.M. Oldenburg, and M.L. Fisher, Time-Windows-Based Filtering Method for Near-Surface Detection of Leakage from Geologic Carbon Sequestration Sites, *Env. Earth Sci.*, submitted.

3. Cortis, A., and C.M. Oldenburg, Short-range atmospheric dispersion of carbon dioxide, *Boundary Layer Meteorology*, in press.

4. Oldenburg, C.M., J.L. Lewicki, L. Dobeck, and L. Spangler, Modeling Gas Transport in the Shallow Subsurface During the ZERT CO2 Release Test, *Transport in Porous Media*, LBNL-1529E, in press, available online, DOI 10.1007/s11242-009-9361-x.

5. Price, P.N., and C.M. Oldenburg, The consequences of failure should be considered in siting geologic carbon sequestration projects, International Journal of Greenhouse Gas Control, Available online May 21, 2009, doi:10.1016/j.ijggc.2009.03.002, LBNL-2051E, in press.

6. Oldenburg, C.M., S.L. Bryant, and J.-P. Nicot, Certification Framework Based on Effective Trapping for Geologic Carbon Sequestration, *Int. J. of Greenhouse Gas Control* 3, 444–457, 2009, LBNL-1549E.

7. Lewicki, J. L., G. E. Hilley, M. L. Fischer, L. Pan, C. M. Oldenburg, L. Dobeck, and L. Spangler (2009), Eddy covariance observations of surface leakage during shallow subsurface CO_2 releases, *J. Geophys. Res.*, 114, D12302, LBNL-1879E, doi:10.1029/2008JD011297.

8. Zhang, Y., C.M. Oldenburg, and S. Finsterle, Percolation-Theory and Fuzzy Rule-Based Probability Estimation of Fault Leakage at Geologic Carbon Sequestration Sites, *Env. Earth Sci.*, LBNL-2172E, in press.

9. Gu C., F. Maggi, W. J. Riley, G. M. Hornberger, T. Xu, C. M. Oldenburg, N. Spycher, N. L. Miller, R. T. Venterea, C. Steefel (2009), Aqueous and gaseous nitrogen losses induced by fertilizer application, J. Geophys. Res. Biogeosci, 114, G01006, LBNL-1689E, doi:10.1029/2008JG000788.

10. Cortis, A., C.M. Oldenburg, and S.M. Benson, The role of optimality in characterizing CO2 seepage from geologic carbon sequestration sites, *Int. J. Greenhouse Gas Control*, 2, 640-652, 2008. LBNL-1417E.

11. Maggi, F., C. Gu, W.J. Riley, G.M. Hornberger, R.T. Venterea, T. Xu, N. Spycher, C. Steefel, N.L. Miller, and C.M. Oldenburg, A mechanistic treatment of the dominant soil nitrogen cycling processes: Model development, testing, and application, Journal of Geophysical Research Biosciences, 113, G02016, 2008,

LBNL-486E, DOI:10.1029/2007JG000578

12. Lewicki, J. L., C. M. Oldenburg, L. Dobeck, and L. Spangler (2007), Surface CO_2 leakage during two shallow subsurface CO_2 releases, Geophys. Res. Lett., 34, L24402, doi:101029/2007GL032047, LBNL-63528.

13. Oldenburg, C.M., Screening and ranking framework for geologic CO2 storage site selection on the basis of health, safety, and environmental risk, *Environmental Geology*, 54, 1687-1694, 2008. DOI 10.1007/s00254-007-0947-8, LBNL-63306.

14. Oldenburg, C.M., Joule-Thomson cooling due to CO_2 injection into natural gas reservoirs, *Energy Conversion and Management*, *48*, 1808-1815, 2007, LBNL-60158.

15. Zhang, Y., C.M. Oldenburg, S. Finsterle, and G.S. Bodvarsson, System-level modeling for economic evaluation of geological CO_2 storage in gas reservoirs, *Energy Conversion and Management*, *48*, 1827-1833, 2007, LBNL-62617.

16. Oldenburg, C.M., and J.L. Lewicki, On leakage and seepage of CO_2 from geologic storage sites into surface water, *Environmental Geology*, *50*(5), 691-705, 2006, LBNL-59225.

17. Lewicki, J.L., G.E. Hilley, and C.M. Oldenburg, An improved strategy to detect CO_2 leakage for verification of geologic carbon sequestration, *Geophys. Res. Letts.*, *32*, L19403, 2005, LBNL-57414.

18. Su, G.W., B.M. Freifeld, C.M. Oldenburg, P.D. Jordan, and P.F. Daley, Interpreting Velocities from Heat-Based Flow Sensors by Numerical Simulation, *Ground Water*, *44*(3), 386-393, Nov. 2005, LBNL-57975.

19. Oldenburg, C.M., and A.J.A. Unger, Coupled vadose zone and atmospheric surface-layer transport of CO_2 from geologic carbon sequestration sites, *Vadose Zone Journal*, *3*, 848–857, 2004, LBNL-55510.

20. Zhang, Y., C.M. Oldenburg, and S.M. Benson, Vadose zone remediation of carbon dioxide leakage from geologic carbon dioxide sequestration sites, *Vadose Zone Journal*, *3*, 858–866, 2004, LBNL-54680.

21. Oldenburg, C.M., S.W. Webb, K. Pruess, and G.J. Moridis, Mixing of stably stratified gases in subsurface reservoirs: a comparison of diffusion models, *Trans. Porous Med.*, *54*(3), 323–334, March 2004, LBNL-51545.

22. Borglin, S. E., T. C. Hazen, C. M. Oldenburg, and P. T. Zawislanski, Comparison of aerobic and anaerobic biotreatment of municipal solid waste, *J. Air and Waste Management Assoc.*, 54, 815-822, 2004, LBNL-50576.

23. Todesco, M., J. Rutqvist, G. Chiodini, K. Pruess, and C.M. Oldenburg, Modeling of recent volcanic episodes at Phlegrean Fields (Italy): Geochemical variations and ground deformation. *Geothermics*, *33*(4), 531–537, 2004, LBNL-53603.

24. Oldenburg, C.M., S.H. Stevens, and S.M. Benson, Economic feasibility of carbon sequestration with enhanced gas recovery (CSEGR), *Energy*, 29,1413–1422, 2004 LBNL-49762.

25. Pruess, K, J. Garcia, T. Kovscek, C. Oldenburg, J. Rutqvist, C. Steefel, and T. Xu, Code intercomparison builds confidence in numerical simulation models for geologic disposal of CO2, *Energy*, 29, 1431–1444, 2004, LBNL-52211.

26. Oldenburg, C.M., and A.J.A. Unger, On leakage and seepage from geologic carbon sequestration sites: unsaturated zone attenuation, *Vadose Zone Journal*, 2(3): 287-296, August 2003. LBNL-51928.

27. Salve, R., C. M. Oldenburg and J.S.Y. Wang, In situ flow experiments in nonwelded tuff: conceptual models and implications for flow in the PTn., *J. Contam. Hydrol., 62-63*, 269-286, 2003, LBNL-48869.

28. Oldenburg, C.M., Carbon dioxide as cushion gas for natural gas storage, *Energy& Fuels*, *17*, 240-246, 2003, LBNL-51053.

29. Zhou, Q.L., H.-H. Liu, G.S. Bodvarsson, and C.M. Oldenburg, Flow and transport in unsaturated fractured rock: effects of multiscale heterogeneity of hydrogeologic properties, *J. Contam. Hydrol.*, *60*, 1–30, 2003, LBNL-50503.

30. Oldenburg, C.M., Foreword to the special issue on strongly coupled density-dependent flow in porous media, *Trans. Porous Med., 47*(2),123-124, May 2002, LBNL-49076.

31. Salve, R. and C.M. Oldenburg, Water flow within a fault in altered nonwelded tuff, *Water Resour. Res.*, 37(12), 3043-3056, 2001, LBNL-45844.

32. Oldenburg, C.M., K. Pruess, and S.M. Benson, Process modeling of CO_2 injection into natural gas reservoirs for carbon sequestration and enhanced gas recovery, *Energy&Fuels 2001*, *15*, 293–298, LBNL-45820.

33. Oldenburg, C.M., and K. Pruess, Simulation of propagating fronts in geothermal reservoirs with the implicit Leonard total variation diminishing scheme, *Geothermics*, 29(2000), 1–25, 2000, LBNL-42620.

34. Oldenburg, C.M, S.E. Borglin, and G.J. Moridis, Numerical simulation of ferrofluid flow for subsurface environmental engineering applications, *Transport in Porous Media*, 38, 319–344, 2000, LBNL-40146.

35. Borglin, S.E., G.J. Moridis, and C.M. Oldenburg, Experimental studies of the flow of ferrofluid in porous media, *Trans. Porous Med.*, *41*, 61–80, 2000, LBNL-40126.

36. Freifeld, B.M., and C.M. Oldenburg, The restricted interval Guelph permeameter: theory and application, *Water Resour. Res.,* 36(6), 1373–1380, 2000, LBNL-42135.

37. Oldenburg, C.M., and K. Pruess, Plume separation by transient thermohaline convection in porous media, *Geophys. Res. Lett.,* 26(19), 2997–3000, 1999, LBNL-43133.

38. Oldenburg, C.M., and K. Pruess, Layered thermohaline convection in hypersaline geothermal systems, *Trans. Porous Med.*, *33*, 26–63, 1998, LBNL-39350.

39. Bennett, D.H., A.L. James, T.E. McKone, and C.M. Oldenburg, On uncertainty in remediation analysis: variance propagation from subsurface transport to exposure modeling, *Reliability Engineering and System Safety*, 62, 117–129, 1998, LBNL-41335.

40. Pruess, K., S. Finsterle, G. Moridis, C. Oldenburg, and Y.-S. Wu. "General-Purpose Reservoir Simulators: The TOUGH2 Family", *GRC Bulletin*, *26*(2), 53–57, both LBNL-39927, LBNL-40140, 1997.

41. James, A.L., and C.M. Oldenburg, Linear and Monte Carlo uncertainty analysis for subsurface contaminant transport simulation, *Water Resour. Res.*, *33*(11), 2495–2508, 1997, LBL-38507.

42. Oldenburg, C.M., K. Pruess, B.J. Travis, Reply to Comment on "Dispersive transport dynamics in a strongly coupled groundwater brine flow system," *Water Resour. Res., 32*(11), 3411–3412, 1996, LBNL-XXXXX.

43. Oldenburg, C.M., and K. Pruess, Mixing with first-order decay in variable velocity porous media flow, *Trans. Porous Med., 22,* 161–180, 1996, LBL-35735.

44. Spera, F.J., C.M. Oldenburg, C. Christensen, and M. Todesco, Simulations of convection with crystallization in the system $KAlSi_2O_6$-$CaMgSi_2O_6$: Implications for compositionally zoned magma bodies, *Am. Mineralogist*, *80,* 1188–1207, 1995.

45. Oldenburg, C.M., and K. Pruess, Dispersive transport dynamics in a strongly coupled groundwater brine flow system, *Water Resour. Res.*, *31*(2), 289–302, 1995, LBL-34487.

46. Oldenburg, C.M., and K. Pruess, On numerical modeling of capillary barriers, *Water Resour. Res.*, *29*(4), 1045–1056, 1993, LBL-32229.

47. Oldenburg, C.M., and F.J. Spera, Hybrid model for solidification and convection, *Num. Heat Trans. B*, *21*, 217-229, 1992, LBL-29899.

48. Oldenburg, C.M., and F.J. Spera, Modeling transport processes in nonlinear systems: The example of solidification and convection, in Chaotic Processes in the Geological Sciences, *The IMA Volumes in Mathematics and its Applications*, *41*, D.A. Yuen, ed., Springer, 317 pp., 1992.

49. Oldenburg, C.M., and F.J. Spera, Numerical modeling of solidification and convection in a viscous pure binary eutectic system, *Int. J. Heat and Mass Trans.*, *34*, 2107–2121, 1991.

50. Oldenburg, C.M., F.J. Spera, and D.A. Yuen, Self-organization in convective magma mixing, *Earth Sci. Revs., 29,* 331–348, 1990 .

51. Oldenburg, C.M., F.J. Spera, D.A. Yuen, and G. Sewell, Dynamic mixing in magma bodies: theory, simulations, and implications, *J. of Geophys. Res.*, *94*(B7), 9215–9236, 1989.

52. Spera, F.J., C.M. Oldenburg, and D.A. Yuen, Magma Zonation: Effects of chemical buoyancy and diffusion, *Geophys. Res. Lett.*, *16*, 1387–1390, 1989.

BOOK CHAPTERS

1. Curtis M. Oldenburg, Steven L. Bryant, Jean-Philippe Nicot, Navanit Kumar, Yingqi Zhang, Preston Jordan, Lehua Pan, Patrick Granvold, Fotini K. Chow, Model Components of the Certification Framework for Geologic Carbon Sequestration Risk Assessment, in Carbon Dioxide Capture for Storage in Deep Geological Formations, Volume 3, L.I. Eide (Ed.), CPL Press and BP, 2009. LBNL-2038E.

2. Oldenburg, C.M., Geologic carbon sequestration: CO_2 transport in depleted gas reservoirs, 419-425, Chap. 26, in Ho, C.K., and S.W. Webb, eds., *Gas Transport in Porous Media*, Springer, 2006, part of the series *Theory and Applications of Transport in Porous Media*, Jacob Bear, Series Editor, vol. 20, Dordrecht, The Netherlands, LBNL-63337.

3. Oldenburg, Curtis M., "Migration mechanisms and potential impacts of CO_2 leakage and seepage," in Wilson and Gerard, editors, *Carbon Capture and Sequestration Integrating Technology, Monitoring, and Regulation*, pp 127-146, Blackwell Publishing 2007, LBNL-58872.

4. Oldenburg, C.M., "Modeling of near-surface leakage and seepage of CO2 for risk characterization," in *Carbon Dioxide Capture for Storage in Deep Geologic Formations*, Vol. 2, D.C. Thomas and S.M. Benson, eds., pp 1205–1216, Elsevier, 2005, LBNL-55493.

5. Intergovernmental Panel on Climage Change, (IPCC) Special Report on CO_2 Capture and Storage, Chap. 5, contributing author.

6. Bodvarsson, G., S. Finsterle, H.H. Liu, C.M. Oldenburg, K. Pruess, E.L. Sonnenthal, and Y.-S. Wu, Flow and transport modeling of the vadose zone, *Vadose Zone Science and Technology Solutions*, *Vols. I and II*, 591-827, 2000.

COMPUTER USER GUIDES

1. Reagan, M.T. and C.M. Oldenburg, WebGasEOS v1.0 User Guide, LBNL-3188, June 2006.

2. Oldenburg, Curtis M., Atmospheric Dispersion Capability for T2VOC, Lawrence Berkeley National Laboratory Report LBNL-58870, August 2005.

3. Oldenburg, C.M., G.J. Moridis, N. Spycher, and K. Pruess, EOS7C Version 1.0: TOUGH2 Module for Carbon Dioxide or Nitrogen in Natural Gas (Methane) Reservoirs, Lawrence Berkeley National Laboratory Report LBNL-56589, March 2004.

4. Oldenburg, Curtis M., T2LBM: Landfill Bioreactor Model for TOUGH2 Version 1.0, Lawrence Berkeley National Laboratory Report *LBNL-47961*, April 2001.

5. Pruess, K., C.M. Oldenburg and G.J. Moridis. TOUGH2 User's Guide Version 2. E. O. Lawrence Berkeley National Laboratory Report *LBNL-43134*, November 1999.

6. Oldenburg, Curtis M. and Karsten Pruess. EOS7R: Radionuclide Transport for TOUGH2, Lawrence Berkeley Laboratory Report *LBL-34868*, 1995.

7. Oldenburg, Curtis M. and K. Pruess. A Two-Dimensional Dispersion Module for the TOUGH2 Simulator, Lawrence Berkeley Laboratory Report *LBL-32505*, 1993.

SELECTED REPORTS

1. Oldenburg, C.M., M.S. Torn, K.M. DeAngelis, J.B. Ajo-Franklin, R.G. Amundson, C.J. Bernacchi, G.M. Bond, E.L. Brodie, M. Carerra, J.N. Christensen, A.B. Cunningham, B. Fouke, T.C. Hazen, A.K. Jain, M. Kleber, K.G. Knauss, S. Nakagawa, K.L. O'Hara, W.J. Parton, W.L. Silver, J.W. Six, W.I. Stringfellow, T.K. Tokunaga, T. Xu, and D. Zilberman (2008). Biologically Enhanced Carbon Sequestration: Research Needs and Opportunities. Report on the Energy Biosciences Institute Workshop on Biologically Enhanced Carbon Sequestration, October 29, 2007, Berkeley, CA, LBNL-713E.

2. Oldenburg, Curtis M., Health, Safety, and Environmental Screening and Ranking Framework for Geologic CO_2 Storage Site Selection, Lawrence Berkeley National Laboratory Report LBNL-58873, September 2005.

3. Oldenburg, Curtis M., Atmospheric Dispersion Capability for T2VOC, Lawrence Berkeley National Laboratory Report LBNL-58870, September 2005.

4. Rebscher, D., and C.M. Oldenburg, Sequestration of Carbon Dioxide with Enhanced

Gas Recovery—Case Study Altmark, North German Basin, Lawrence Berkeley National Laboratory Report LBNL-59033, December 2005.

5. Oldenburg, C.M., and J.L. Lewicki, Leakage and seepage of CO2 from geologic carbon sequestration sites: CO2 migration into surface water, Lawrence Berkeley National Laboratory Report *LBNL-57768*, June 2005.

6. Jordan, P.D., C.M. Oldenburg, G.W. Su, Analysis of aquifer response, groundwater flow, and plume evolution at Site OU 1, former Fort Ord, California, Lawrence Berkeley National Laboratory Report *LBNL-57251*, February 2005.

7. Su, G.W., B.M. Freifeld, C.M. Oldenburg, P.D. Jordan, and P.F. Daley, Simulation of in-situ permeable flow sensors for measuring groundwater flow velocity, Lawrence Berkeley National Laboratory Report *LBNL-57084*, February 2005.

8. Benson, S.M., L.R. Myer, C.M. Oldenburg, and entire GEO-SEQ team, GEO-SEQ Best Practices Manual. Geologic Carbon Dioxide Sequestration: Site Evaluation to Implementation, Lawrence Berkeley National Laboratory Report *LBNL-56623*, 2004.

9. Lewicki, J.L., and C.M. Oldenburg, Strategies for Detecting Hidden Geothermal Systems by Near-Surface Gas Monitoring, Lawrence Berkeley National Laboratory Report LBNL-56895, December 2004.

10. Oldenburg, C.M, A.J. Unger, Y. Zhang, J.L. Lewicki, and P.D. Jordan, HSE risk assessment of deep geological storage sites, Final Report, *LBNL-54411*, 12/12/2003.

11. Oldenburg, C.M., Y. Zhang, J.L. Lewicki, and P.D. Jordan, Preliminary application of a coupled modeling framework for CO2 leakage and seepage at the Rio Vista gas field, Task 5 Report, *LBNL-54051*, 10/31/2003.

12. Oldenburg, C.M., J.L. Lewicki, and R.P. Hepple, Near-surface monitoring strategies for geologic carbon dioxide storage verification, Lawrence Berkeley National Laboratory Report *LBNL-54089,* October 2003.

13. Oldenburg, C.M., A.J.A. Unger, Coupled Modeling Framework for CO_2 Leakage and Seepage Risk Assessment, Task 4 Report, *LBNL-53009,* June 2003.

14. Oldenburg, C.M., A.J.A. Unger, and R.P. Hepple, On Atmospheric Dispersion of CO_2 Seepage from Geologic Carbon Sequestration Sites, Task 3 Report, *LBNL-51734,* November 2002.

15. Pruess, K, J. Garcia, T. Kovscek, C. Oldenburg, J. Rutqvist, C. Steefel, and T. Xu, Intercomparison of numerical simulation codes for geologic disposal of CO2, Lawrence Berkeley National Laboratory Report *LBNL-51813*, 11/27/2002.

16. Oldenburg, C.M., T.E. McKone, R.P. Hepple, and A.J.A. Unger, Health Risks from Leakage and Seepage of CO_2 Sequestered in the Subsurface: Requirements and

Design of a Coupled Model for Risk Assessment, Task 2 Report, *LBNL-51131*, July 2002.

17. Oldenburg, C.M., A.J.A. Unger, R.P. Hepple, and P.D. Jordan, On Leakage and Seepage from Geologic Carbon Sequestration Sites, Task 1 Report, *LBNL-51130*, July 2002.

18. Oldenburg, C.M., P.F. Daley, B.M. Freifeld, J. Hinds, and P.D. Jordan, Three-dimensional groundwater flow, aquifer response, and treatment system monitoring at site OU 1, Former Fort Ord, California, Lawrence Berkeley National Laboratory Report *LBNL-49586*, February 2002.

19. Kneafsey, T.J., C.M. Oldenburg, R. Salve, The effect of clay swelling on fracture flow in the paintbrush nonwelded unit of the Topopah spring tuff, Lawrence Berkeley National Laboratory Report *LBNL-48125*, 2001.

20. Zawislanski, P.T., C.M. Oldenburg, C.A. Doughty, and B.M. Freifeld, Application of the vadose zone monitoring system at a TCE-contaminated site: Field data and modeling summary, E. O. Lawrence Berkeley National Laboratory Report *LBNL-44325*, September 1999.

21. Doughty, C., C.M. Oldenburg and A.L. James. Site S-7 VOC Transport modeling for the Vadose Zone Monitoring System (VZMS), McClellan AFB - 1999 Semi-Annual Report, *LBNL-43526*, 1999.

22. James, A.L. and C.M. Oldenburg. Site S-7 Representative Model and Application for the Vadose Zone Monitoring System (VZMS) McClellan AFB - 1998 Semi-Annual Report, *LBNL-42643*, 1998.

23. Borglin, Sharon, G. Moridis and C. Oldenburg. "On magnetic fluid emplacement: Laboratory Experiments of Ferrofluid Flow". Lawrence Berkeley National Laboratory Report *LBNL-42203*, 1997.

24. James, A.L, and C.M. Oldenburg, Enhanced data analysis for the VZMS: Conceptual Model Design and Initial Application for the Vadose Zone Monitoring System (VZMS), McClellan AFB. 1998 Semi-Annual Report, *LBNL-41909*, 1998.

25. Cohen, Andrew J.B., C.M. Oldenburg, A.M. Simmons, Anil K. Mishra, and J. Hinds. "S^4Z: Sub-Site-Scale Saturated Zone Model for Yucca Mountain". In International High-Level Waste Management Conference & Exposition; Las Vegas, NV; May 11-14, 1998, *LBNL-41773*.

26. Moridis, G.J., S.E. Borglin, C.M. Oldenburg, and A. Becker. FY1997 Annual Report: Theoretical and Experimental Investigations of Ferrofluids for Guiding and Detecting Liquids in the Subsurface, Lawrence Berkeley National Laboratory Report *LBNL-41069*, 1998.

27. Zawislanski, P.T. and C.M. Oldenburg. Data analysis for preliminary conceptual model design, Vadose Zone monitoring system (VZMS), McClellan AFB. 1997 Annual Report, *LBNL-41262*, 1998.

28. Oldenburg, Curtis. Comparison of scale analysis and Numerical Simulation for Saturated Zone convective mixing processes, Lawrence Berkeley National Laboratory Report *LBNL-40365*, 1998.

29. Moridis, G., P. Persoff, J, Apps, A. James, C. Oldenburg, A. McGrath, L. Myer, L. Pellerin, and K. and Pruess. A Design Study for the Isolation of the 281-3H Retention Basin at the Savannah River Site Using the Viscous Liquid Barrier Technology, *LBNL-38920*, 1996.

30. Oldenburg, C.M. and K. Pruess. Application of TOUGH2/EOS7R to Modeling of Radionuclide Release from a Low/Intermediate Level Repository under Two-Phase Conditions, *LBNL-38837*, 1996.

31. Oldenburg, C.M. and K. Pruess. Numerical Simulation of Coupled Flow and Transport with TOUGH2: A Verification Study, Lawrence Berkeley National Laboratory Report *LBL-35273*, 1994.

32. Oldenburg, C.M., J.C.S. Long, J.S. Jacobsen, A.L. James, A.R. Kovscek, and H.S. Mountford, Onshore Oil Spill Impact: Data Assessment, Physical Processes, and Preliminary recommendations, Lawrence Berkeley Laboratory Report *LBNL-39256*, 1996.

SELECTED CONFERENCE PROCEEDINGS

1. Oldenburg, C.M., S.L. Bryant, J.-P. Nicot, M.J. Coombs, C. Doughty, P.D. Jordan, N. Kumar, and J. Wagoner, Preliminary risk assessment for WESTCARB's Phase 3 CO_2 injection at the Kimberlina Power Plant, San Joaquin Valley, California, Lawrence Berkeley National Laboratory, Internal Report, April, 2008.

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